Response (in blue) to comments by Anonymous Referee #1

This study aims to assess how extreme the drought year 2018 was in Germany and the Netherlands, based on standard drought indices (SPI, SSI), also potential precipitation deficit (PPD), and ET deficit. The study used HYDRUS 1D simulations for 31 stations with long-term meteo observations, and calculated soil moisture, potential ET, and actual ET for five soil types. Their results show that the increasing droughts over Germany and the Netherlands are mainly driven by increasing potential ET and increasing vegetation water demand. While the topic is relevant and analysis is interesting, this reviewer found the manuscript cannot be accepted with the current form.

Response: We very much appreciate the comments by the reviewer. We will revise the manuscript taking into account the comments.

Major concern:
This reviewer found that the study/experiment design could be flawed, mainly due to the lack of description on how representative the five soil types used for representing the different domains, and the lack of description on why the pasture is assumed for all these stations. To this reviewer, the current study is merely a synthetic study. Thus, it is far from understanding the drought year 2018 over the Netherlands and Germany.

Response: We thank the reviewer for this comment and the opportunity to clarify better our objectives. We will in the revised version of the paper also improve the clarification of our objectives, taking into account the reviewer comments.

The five soil types are representative for the domain because they cover well the soil texture triangle and for each location calculations are repeated for these five soil types, covering different possible conditions near the measurement sites. It can be expected that in a region around a measurement site all these different soil types are present. In this study, our main objective is not to determine for each location as good as possible what soil moisture and evapotranspiration conditions were in 2018. This would require the use of all possible information sources including remote sensing information on soil moisture and vegetation states, precise soil and land use land cover information, among others. Our objective was to make a standardized comparison with past years and past droughts. For the further past, especially before the year 2000, remote sensing information is not of good quality, and a data-based comparison is not possible. This is the reason why we used a model-based comparison, covering all possible soil types.

The pasture was chosen because in this case it is known that all 31 meteorological stations are default located on a pasture. However, we agree with the reviewer that in a similar manner as for soil types, it would have been possible to cover different vegetation types (e.g., grassland, crop land, forest). To some limited extent, we took different vegetation states into account by performing calculations with two different LAI time series. We decided not to include simulations for different vegetation types given the large amount of information already

included in the paper, and also because we found that for the five different soil types, the drought trends and ranking of the drought years were hardly affected by soil type, in spite of the fact that absolute soil moisture contents showed large differences between soil types. For the two LAI time series smaller absolute differences among sites were observed (than for soil types), and the ranking was not affected. We already included a discussion on the impact of vegetation type on the results, pointing to the fact that for deep rooting vegetation rankings could be affected. We consider that our model-based comparison already covers many different conditions and think that a further extension is beyond the scope of this manuscript, and will not affect the main conclusions of this paper.

We will modify the manuscript to better motivate why we used this study design, and that the main objective is a standardized model-based comparison in the context of a lack of precise data for the years further in the past. We will stress that the objective is not to make site-specific best estimates of soil moisture and ET conditions in the past.